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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/742,148	12/19/2000	Roland Buelow	A-61008-1/RFT/TAL	8637

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EXAMINER

BELYAVSKYI, MICHAEL A

ART UNIT	PAPER NUMBER
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1644

DATE MAILED: 05/20/2003

17

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/742,148

Applicant(s)

BUELOW, ROLAND

Examiner

Michail A Belyavskyi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

1. The **examiner** of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Michail Belyavskyi, Group Art Unit 1644, Technology Center 1600

2. Claims 13-17 are pending.

3. Applicant's election of SEQ ID NO:3 as specific species of an oligopeptide in Paper No. 16, filed 2/10/03 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 13-17 read on a compound comprising an oligopeptide of SEQ ID NO:3 and are under consideration in the instant application.

4. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Applicant is requested to identify the written support for the claim 16, particularly the claimed limitations of a compound of at least 10 amino acids including recited sequence. Alternatively, Applicant is invited to amend the specification to provide antecedent basis for the claimed subject matter.

5. Claim 16 is objected to under 37CFR 1.821(d) for failing to recite the SEQ ID NO. in the claims.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 13 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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A. Claim 13 is indefinite and ambiguous in the recitation of: (i) “ a compound comprising an oligopeptide of at least 6 amino acids,... wherein amino acids 84 to 86 are YYW ” and (ii) “species analog thereof “

With regard to (i): The claim as written encompass an oligopeptide of 6 amino acid. It is unclear how an oligopeptide of only 6 amino acid can have amino acids 84 to 86 ?

With regard to (ii): The characteristics and metes and bounds of “species analog ” are unclear and indefinite and not defined by the specification.

B. Claim 16 is indefinite and ambiguous in the recitation of “ ... according of Claim 15 of at least 10 amino acids including the sequence...” because the base claim 15 recited a compound consisting of 14 amino acids. It is suggested that said phrase be change to “ ...according to Claim 15 wherein at least 10 amino acids includes the sequence....”.

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 13, 14, 16 and 17 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a compound consisting of specific oligopeptide SEQ ID NOs 3-56 does not reasonably provide enablement for: (i) *any* compound comprising an oligopeptide of at least 6 amino acids comprising a contiguous sequence of the HLA-B α 1 or species analog thereof, recited in claim 13; (ii) *any* compound comprising an oligopeptide of at least 8 amino acids comprising the triad YYW and comprising a contiguous sequence of the sequence as recited in Claim 14; or (iii) *any* compounds comprising amino acid sequences recited in Claims 16 and 17. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The specification does not enable one of skill in the art to practice the invention as claimed without undue experimentation.

The claims as written encompass the genus of oligopeptides amino acid sequences. The genus encompasses oligopeptides wherein such oligopeptides have numerous differences in amino acid sequences.

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Factors to be considered in determining whether undue experimentation is required to practice the claimed invention are summarized *In re Wands* (858 F2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988)). The factors most relevant to this rejection are the scope of the claim, the amount of direction or guidance provided, limited working examples, the unpredictability in the art and the amount of experimentation required to enable one of skill in the art to practice the claimed invention.

Applicant discloses an oligopeptides consisting of SEQ ID NOS: 3-56 that can modulate lymphocyte activity in the instant specification (see pages 15-18 in particular). Applicant has not taught how to make and use *any* compound comprising an oligopeptide of at least 6 amino acids comprising a contiguous sequence of the HLA-B α 1 or species analog thereof, recited in claim 13; (ii) *any* compound comprising an oligopeptide of at least 8 amino acids comprising the triad YYW and comprising a contiguous sequence of the sequence as recited in Claim 14; or (iii) *any* compounds comprising amino acid sequences recited in Claims 16 and 17 that can modulate lymphocyte activity. The structural and functional characteristics of said oligopeptides are not defined in the specification and in the claims. The specification fails to provide sufficient guidance as to which core structure of SEQ ID NOS: 3-56 is essential for maintain their activity and which changes can be made in the structure of SEQ ID Nos. and still maintained the same function. In addition, no guidance is given with regard to what oligopeptides have the property of being “species analogs” The is no guidance in the specification with regard to whether “species analogs” refer to analogs defined as belonging to the same species because they hare a common function or because they share common structural elements , Applicant has not exemplified *in vitro* studies or in animal models any “species analogs” that can modulate lymphocyte activity. Using *any* “species analog” does not necessarily ensure its ability to fulfill the claimed function. Moreover, Applicant himself acknowledge that only a specific sequences including amino acids at specific position are permitted to performed the claimed modulation of lymphocyte activity (see page 10, lines 10-20 in particular).

“Comprising” is considered open-ended claim language and includes amino acid residues outside of the specified peptide. Therefore, (i) *any* compound comprising an oligopeptide of at least 6 amino acids comprising a contiguous sequence of the HLA-B α 1 or species analog thereof, recited in claim 13; (ii) *any* compound comprising an oligopeptide of at least 8 amino acids comprising the triad YYW and comprising a contiguous sequence of the sequence as recited in Claim 14; or (iii) *any* compounds comprising amino acid sequences recited in Claims 16 and 17 includes an unlimited number of amino acid sequences “comprising” an unlimited number of polypeptides. The disclosure of SEQ ID NOS: 3-56 cannot support the entire genus of *any* compound comprising an oligopeptide of at least 6 amino acids comprising a contiguous sequence of the HLA-B α 1 or species analog thereof, recited in claim 13; (ii) *any* compound comprising an oligopeptide of at least 8 amino acids comprising the triad YYW and comprising a contiguous sequence of the sequence as recited in Claim 14; or (iii) *any* compounds comprising amino acid sequences recited in Claims 16 and 17 as part of their sequence.

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Also an issue is that Applicant has not taught how to make and use a compound comprising an oligopeptide of 6 amino acids wherein amino acids 84 to 86 are YYW, as claimed in claim 13. The claim as written encompass an oligopeptide of 6 amino acid. It is unclear how one skill in the art can make an oligopeptide of only 6 amino acid that will have triad YYW at position 84 to 86 as part of their sequence?

Protein chemistry is probably one of the most unpredictable areas of biotechnology. It is known in the art that even single amino acid changes or differences in a proteins amino acid sequence can have dramatic effects on the protein's function. For example, Mikayama et al. (PNAS, 1993. 90: 10056-10060) teach that the human glycosylation factor (GIF) protein differs from human macrophage migration inhibitory factor (MIF) by a single amino acid residue (see Figure 1 in particular). Yet, Mikayama et al. further teach that GIF is unable to carry out the function of MIF and MIF does not demonstrate GIF activity (see Abstract in particular). Burgess et al (J Cell Biol. 111:2129-2138, 1990) show that a conservative replacement of a single "lysine" residue at position 118 of acidic fibroblast growth factor by "glutamic acid" led to the substantial loss of heparin binding, receptor binding and biological activity of the protein. Similarly, Lazar et al. (Mol Cell Biol. 8:1247-1252, 1988) teach that in transforming growth factor alpha, replacement of aspartic acid at position 47 with alanine or asparagines did not affect biological activity while replacement with serine or glutamic acid sharply reduced the biological activity of the mitogen. These references demonstrate that even a single amino acid substitution or what appears to be an inconsequential chemical modification will often dramatically affect the biological activity and characteristic of a protein. Furthermore, the specification fails to teach what deletions, truncations, substitutions and mutations of the disclosed sequence can be tolerated that will allow the oligopeptide to function as claimed. While it is known that many amino acid substitutions are possible in any given protein, the position within the protein's sequence where such amino acid substitutions can be made with reasonable expectation of success are limited. Certain positions in the sequence are critical to the three-dimensional structure/function relationship, and these regions can tolerate only conservative substitutions or no substitutions. Residues that are directly involved in protein functions such as binding will certainly be among the most conserved (Bowie et al. Science, 247:1306-1310, 1990, p 1306, col. 2).

Applicant is relying upon certain biological activities and the disclosure of a limited number of species to support an entire genus. It is well known that minor structural differences among even structurally related compounds or compositions can result in substantially different biology, expression, and pharmacology of proteins. Therefore, structurally unrelated (i) *any* compound comprising an oligopeptide of at least 6 amino acids comprising a contiguous sequence of the HLA-B α 1 or species analog thereof, recited in claim 13; (ii) *any* compound comprising an oligopeptide of at least 8 amino acids comprising the triad YYW and comprising a contiguous sequence of the sequence as recited in Claim 14; or (iii) *any* compounds comprising amino acid sequences recited in Claims 16 and 17 encompassed by the claimed invention other than "a compound consisting of specific oligopeptide SEQ ID NOs 3-56" would be expected to have greater differences in their activities.

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Since the amino acid sequence of a polypeptide determines its structure and functional properties, predictability of which changes can be tolerated in a polypeptide's amino acid sequence and still retain similar functionality (e.g. generation of antibodies which recognize p33) requires a knowledge of, and guidance with regard to, which amino acids in the polypeptide's sequence, if any, are tolerant of modification and which are conserved (i.e. expectedly intolerant to modification) and detailed knowledge of the ways in which a polypeptide's structure relates to its functional usefulness. However, the problem of predicting polypeptide structure from mere sequence data of a single amino acid sequence and in turn utilizing predicted structural determinations to ascertain functional aspects the peptides and finally, what changes can be tolerated with respect thereto is complex and well outside the realm of routine experimentation.

Since the amino acid sequence of a polypeptide determined its structural and functional properties, predictability of which fragments will retain functionality requires knowledge of, and guidance with regard to, which amino acids in the polypeptide's sequence contribute to its structure, and therefore, function. The problem of predicting which fragments or derivatives of a protein will retain functionality and which will not is complex and well outside the realm of routine experimentation. Because of the lack of sufficient guidance and predictability in determining which structures would lead to functional proteins or peptides with the desired properties and that the relationship between the sequence of a peptide and its tertiary structure (i.e. its activity) was not well understood and was not predictable (e.g. see Ngo et al, in The Protein Folding Problem and Tertiary Structure Prediction, 1994. (ed.), Birkhauser, Boston, MA, pp. 433 and 492-495.); it would require an undue amount of experimentation for one of skill in the art to arrive at the breadth of proteins encompassed by the claimed invention. Without sufficient guidance, the changes which can be made in the structure of "any compound comprising an oligopeptide of at least 6 amino acids comprising a contiguous sequence of the HLA-B α 1 or species analog thereof, recited in claim 13; (ii) any compound comprising an oligopeptide of at least 8 amino acids comprising the triad YYW and comprising a contiguous sequence of the sequence as recited in Claim 14; or (iii) any compounds comprising amino acid sequences recited in Claims 16 and 17 " and still specifically modulate lymphocyte activity is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue

Thus, Applicant has not provided sufficient guidance to enable one skill in the art to use claimed (i) any compound comprising an oligopeptide of at least 6 amino acids comprising a contiguous sequence of the HLA-B α 1 or species analog thereof, recited in claim 13; (ii) any compound comprising an oligopeptide of at least 8 amino acids comprising the triad YYW and comprising a contiguous sequence of the sequence as recited in Claim 14; or (iii) any compounds comprising amino acid sequences recited in Claims 16 and 17 in manner reasonably correlated with the scope of the claims. The scope of the claims must bear a reasonable correlation with the scope of enablement. *In re Fisher*, 166 USPQ 18 (CCPA 1970) indicates that the more unpredictable an area is, the more specific enablement is necessary in order to satisfy the statute.

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In view of the quantity of experimentation necessary, the unpredictability of the art, the lack of sufficient guidance in the specification, the limited working examples, and the limited amount of direction provided given the breadth of the claims, it would take undue trials and errors to practice the claimed invention.

10 . Claims 13, 14, 16 and 17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant is in possession of : a compound consisting of specific oligopeptide SEQ ID NOs 3-56.

Applicant is not in possession of : (i) *any* compound comprising an oligopeptide of at least 6 amino acids comprising a contiguous sequence of the HLA-B α 1 or species analog thereof, recited in claim 13; (ii) *any* compound comprising an oligopeptide of at least 8 amino acids comprising the triad YYW and comprising a contiguous sequence of the sequence as recited in Claim 14; (iii) *any* compounds comprising amino acid sequences recited in Claims 16 and 17.

The specification fails to define *any* compound comprising an oligopeptide of at least 6 amino acids comprising a contiguous sequence of the HLA-B α 1 or any species analog thereof, recited in claim 13; (ii) *any* compound comprising an oligopeptide of at least 8 amino acids comprising the triad YYW and comprising a contiguous sequence of the sequence as recited in Claim 14; or (iii) *any* compounds comprising amino acid sequences recited in Claims 16 and 17 .

Applicant has disclosed a limited number of species; therefore, the skilled artisan cannot envision all the contemplated amino acid sequence possibilities recited in the instant claims. Consequently, conception in either case cannot be achieved until a representative description of the structural and functional properties of the claimed invention has occurred, regardless of the complexity or simplicity of the method. Adequate written description requires more than a mere statement that it is part of the invention. The sequences themselves are required. See Fiers v. Revel, 25 USPQ2d 1601, 1606 (CAFC 1993).

A description of a genus of protein sequences may be achieved by means of a recitation of a representative number of polypeptide sequences, defined by amino acid sequence, falling within the scope of the genus, or of a recitation of structural features common to the genus, which features constitute a substantial portion of the genus. *Regents of the University of California v. Eli Lilly & Co.*, 119 F3d 1559, 1569, 43 USPQ2d 1398, 1406 (Fed. Cir. 1997).

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Vas-Cath Inc. v. Mahurkar, 19 USPQ2d 1111, makes clear that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the written description inquiry, whatever is now claimed." (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." (See Vas-Cath at page 1116.). Consequently, Applicant was not in possession of the instant claimed invention. See University of California v. Eli Lilly and Co. 43 USPQ2d 1398.

Applicant is directed to the Guidelines for the Examination of Patent Applications Under the 35 U.S.C. 112, ¶ 1 "Written Description" Requirement, Federal Register, Vol. 66, No. 4, pages 1099-1111, Friday January 5, 2001.

11. No claim is allowed.


12. The prior art does not teach or suggest the claimed invention recited in claims 13-17.

13. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which Applicant may become aware in the specification.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michail Belyavskyi whose telephone number is (703) 308-4232. The examiner can normally be reached Monday through Friday from 9:00 AM to 5:30 PM. A message may be left on the examiner's voice mail service. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Chan can be reached on (703) 308-3973. Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center 1600 receptionist whose telephone number is (703) 308-0196.

Papers related to this application may be submitted to Technology Center 1600 by facsimile transmission. Papers should be faxed to Technology Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CM1 Fax Center telephone number is (703) 305-3014.

Michail Belyavskyi, Ph.D.
Patent Examiner
Technology Center 1600
May 19, 2003


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